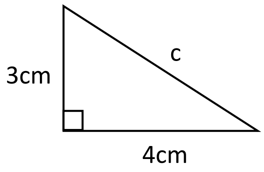
RIGHT ANGLE TRIANGLES - (DON'T FORGET AREA = ½ BASE X HEIGHT)

If a triangle has a **right angle triangle**, use **Pythagoras** or **SOH CAH TOA**

PYTHAGORAS' THEOREM find missing **lengths** only $\mathbf{a^2 + b^2 = c^2}$

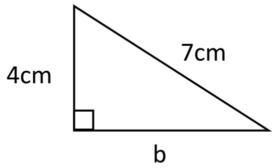
Hypotenuse is the side opposite the right angle and the longest side



$c^2 = 3^2 + 4^2$

$c^2 = 9 + 16$

HYPOTENUSE **ADD**



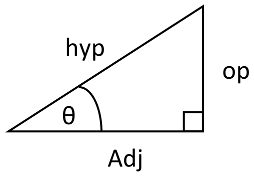
$7^2 = 4^2 + b^2$

$b^2 = 7^2 - 4^2$

SHORT SIDE **SUBTRACT**

Pythagoras Theorem $c^2 = a^2 + b^2$ The square of the hypotenuse is equal to the sum of the square of the two shortest sides.

TRIGONOMETRY for questions **with**, or requiring an **angle**



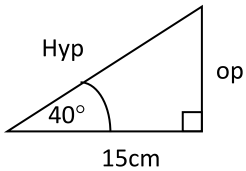
for **angle ϑ**, Hyp = hypotenuse

Opp = opposite side

Adj= Adjacent side

FINDING LENGTHS USE SIN, COS, TAN
FINDING ANGLES USE SIN^{-1}, COS^{-1}, TAN^{-1}

Sin $\vartheta = \frac{\textbf{O}pp}{\textbf{H}yp}$, **C**os $\vartheta = \frac{\textbf{A}dj}{\textbf{H}yp}$, **T**an $\vartheta = \frac{\textbf{O}pp}{\textbf{A}dj}$ SOH CAH TOA



Find the **length** of the hypotenuse side and Opposite side.

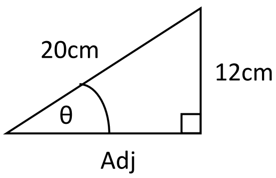
We know the <u>Adjacent side</u> = 15cm <u>Angle</u> = 40° SOH <u>CA</u>H <u>T</u>O<u>A</u>

- To calc <u>Opposite</u> side, use **T**an $\vartheta = \frac{\textbf{O}pp}{\textbf{A}dj}$

  $\text{Tan } 40° = \frac{Opp}{15}$ 15 x Tan40° = Opp Opp = 12.59cm

- To calc <u>Hypotenuse</u> side use. **C**os $\vartheta = \frac{\textbf{A}dj}{\textbf{H}yp}$

  $\text{Cos } 40° = \frac{15}{Hyp}$ $Hyp = \frac{15}{\cos 40°}$ Hyp = 19.58cm



Calculate the Adjacent side and angle θ.

We know, the <u>Hypotenuse</u> and <u>opposite</u> side S<u>OH</u> CAH TOA

- To calc <u>Adj side</u> use Pythagoras Theorem
  $Adj^2 = 20^2 - 12^2$ Adj = 16

- To calc size of <u>angle</u> <u>θ</u>. Use **S**in $\vartheta = \frac{\textbf{O}pp}{\textbf{H}yp}$

  $\text{Sin } \theta = \frac{12}{20}$ $\theta = \text{Sin}^{-1}\frac{12}{20}$ θ = 36.87°

Need the angle ϑ, use Sin^{-1} to get rid of Sin